

SECOND PUBLIC WORKSHOP

EARLY ACTIONS FOR CLIMATE CHANGE MITIGATION IN CALIFORNIA

California Environmental Protection Agency

 **Air Resources Board**

April 23, 2007

WORKSHOP AGENDA

1:30 – 1:40 pm	Welcome and Housekeeping
1:40 – 1:50 pm	Opening Remarks and Overall Goals
1:50 – 2 :30 pm	Programmatic Overview
	Review Schedule and Progress to Date
	Update on Early Action Strategies
2:30 – 4:15 pm	Questions, Comments, and Suggestions
4:15 – 4:30 p.m.	Closing Remarks / Adjournment

Where We Are

- First ARB workshop January 22
 - 70+ ideas for early action
 - Two reports in response (ARB, CAT)
 - ARB board hearing June 21-22
 - CAT public meeting June 26
-
- Next two weeks – last opportunity for public comment before ARB staff finalizes report

“Discrete Early Actions” are

- Regulations to be adopted by ARB
- Must be listed by June 30, 2007
- Must be enforceable by January 1, 2010
- *Our interpretation: adopted by late 2008, processed thru OAL, and legally on the books by January 1, 2010*

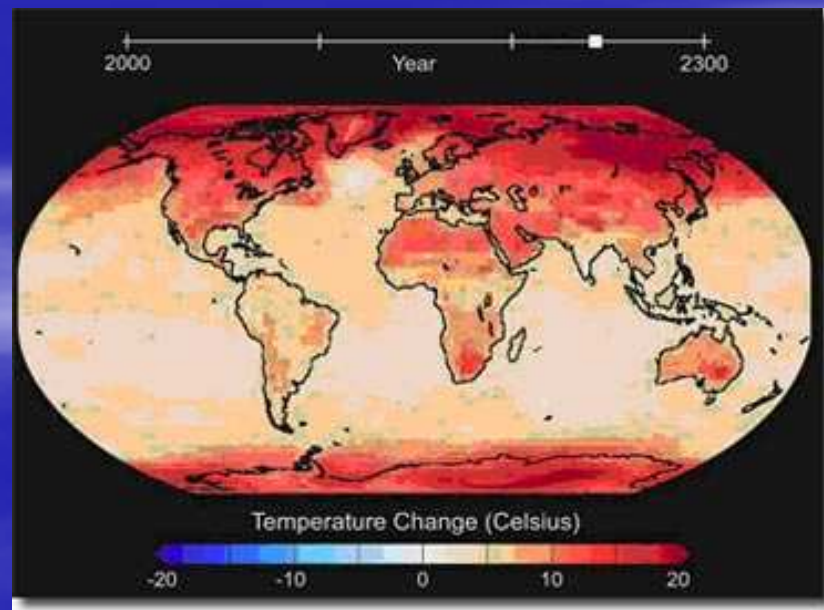
They Also Are...

- Everything state agencies are collectively doing to reduce GHG emissions between now and when ARB's comprehensive scoping plan is adopted and implemented



Theory Behind Early Action

- Climate threat is urgent
- Reductions take time – have to start now
- Regulations prove CA is serious



Broader Context

- California has multiple clean air goals
- Public health is the highest priority
- Rulemaking is constantly underway
- “Early Action Measures” part of the flow
- Many more actions are necessary to reach the State’s ultimate GHG reduction goal

Conveyer Belt Concept

- Pending rules are always moving through system; ARB staff launches each one for adoption 2-3 years later, with implementation thereafter...



What's Already Moving

- Major diesel regulations (offroad equipment, onroad trucks, goods movement sources)
 - Ozone precursor rules
 - Air toxic control measures
 - New ambient standards
-
- Existing GHG control efforts (especially clean energy policies & efficiency)

What We're Adding

- Biggest bang for the buck GHG measure (Low Carbon Fuel Standard)
- Two additional rules by late 2008
- 20+ more GHG measures underway
- *All without losing momentum on public health protection*

Public Health Comes First

- If you can't breathe, nothing else matters
- You need to live a full life to participate fully in the global warming solution

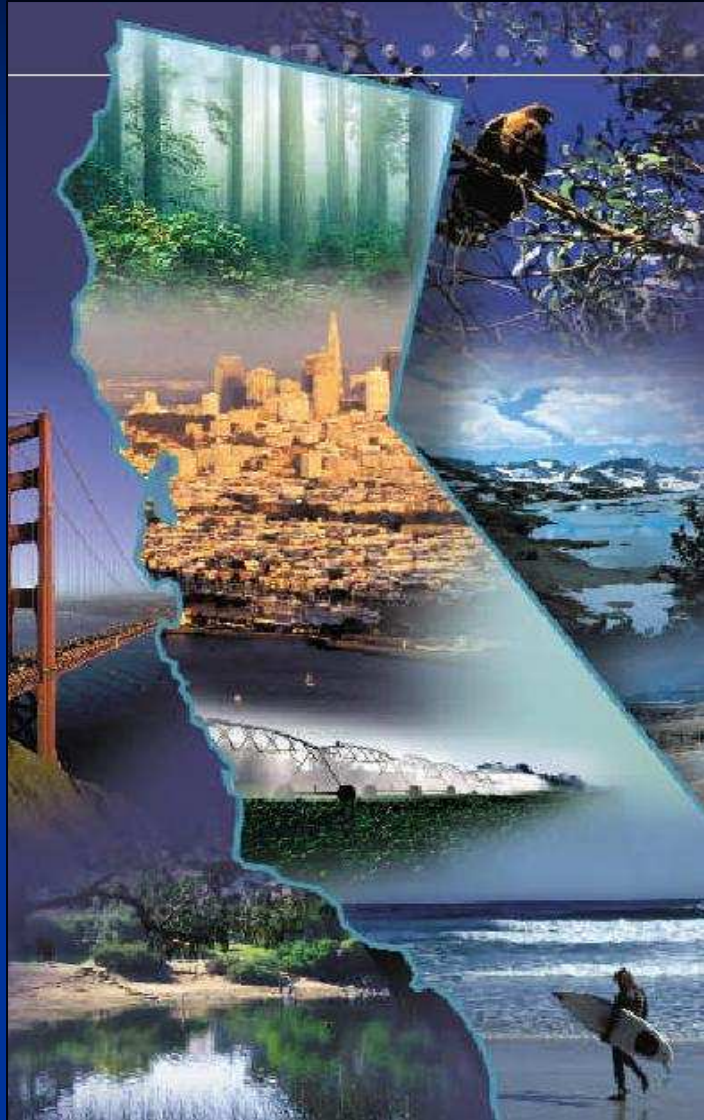


What That Means

- Diesel PM, NO_x, VOC reductions come first but staff will combine with GHG reductions whenever possible
- *Example: pending diesel truck rule*
- GHG disbenefits will not disqualify rules essential for public health protection
- *Example: sulfur reductions*

ARB Staff Perspective

- Addressing climate change is the most difficult challenge ARB has faced to date
- We share the bill authors' sense of urgency
- The revised proposal commits to moving on several GHG fronts at once



Programmatic Overview

California Climate Impacts (over the past 100 years)



**1.3 °F higher
temperatures**

~7 inch sea level rise

**12% decrease in
fraction of runoff
between April and July**

**Snowmelt and spring
blooms advanced 2
days/decade since 1955**

Lyell Glacier

Yosemite National Park

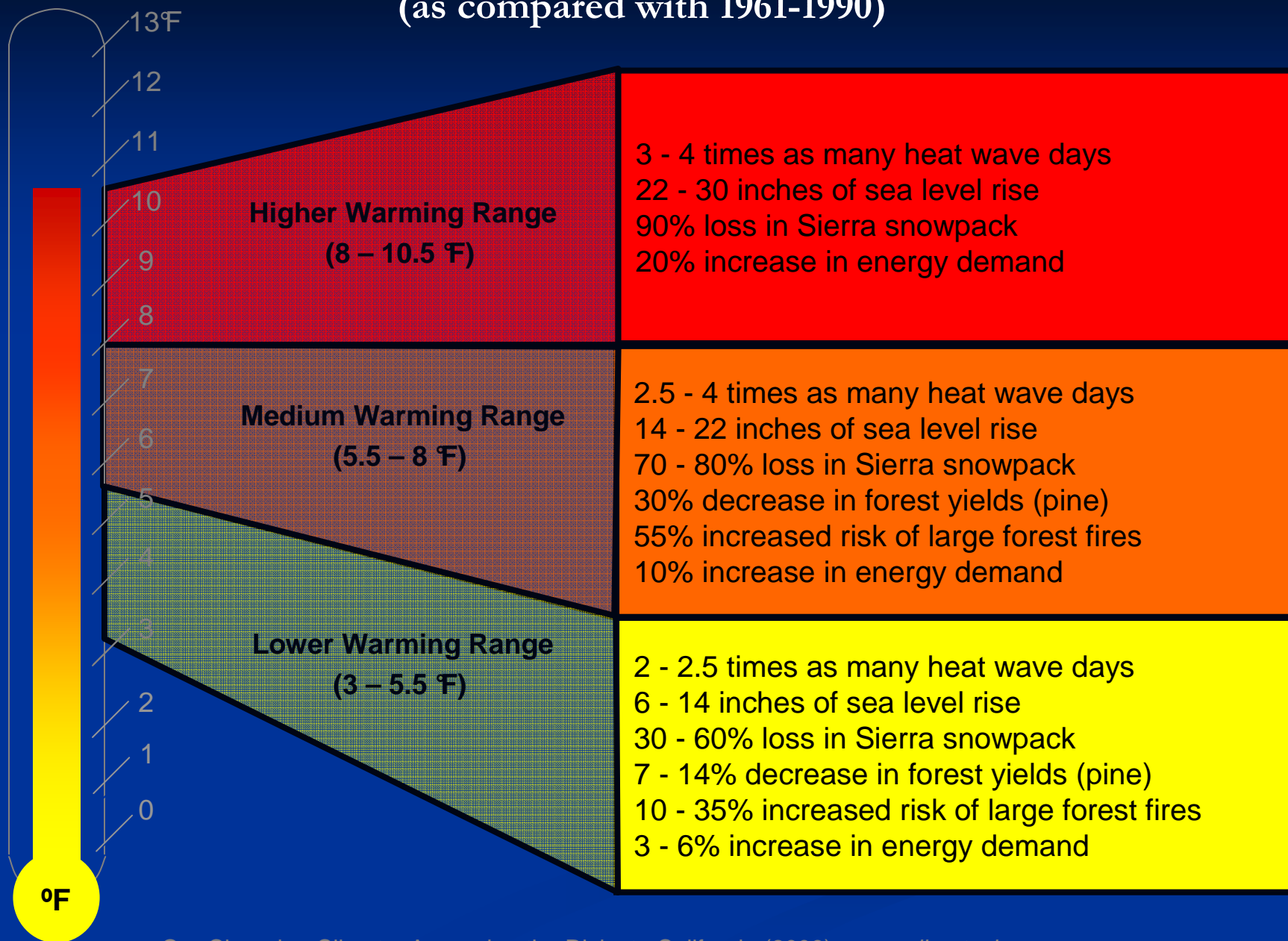


1903

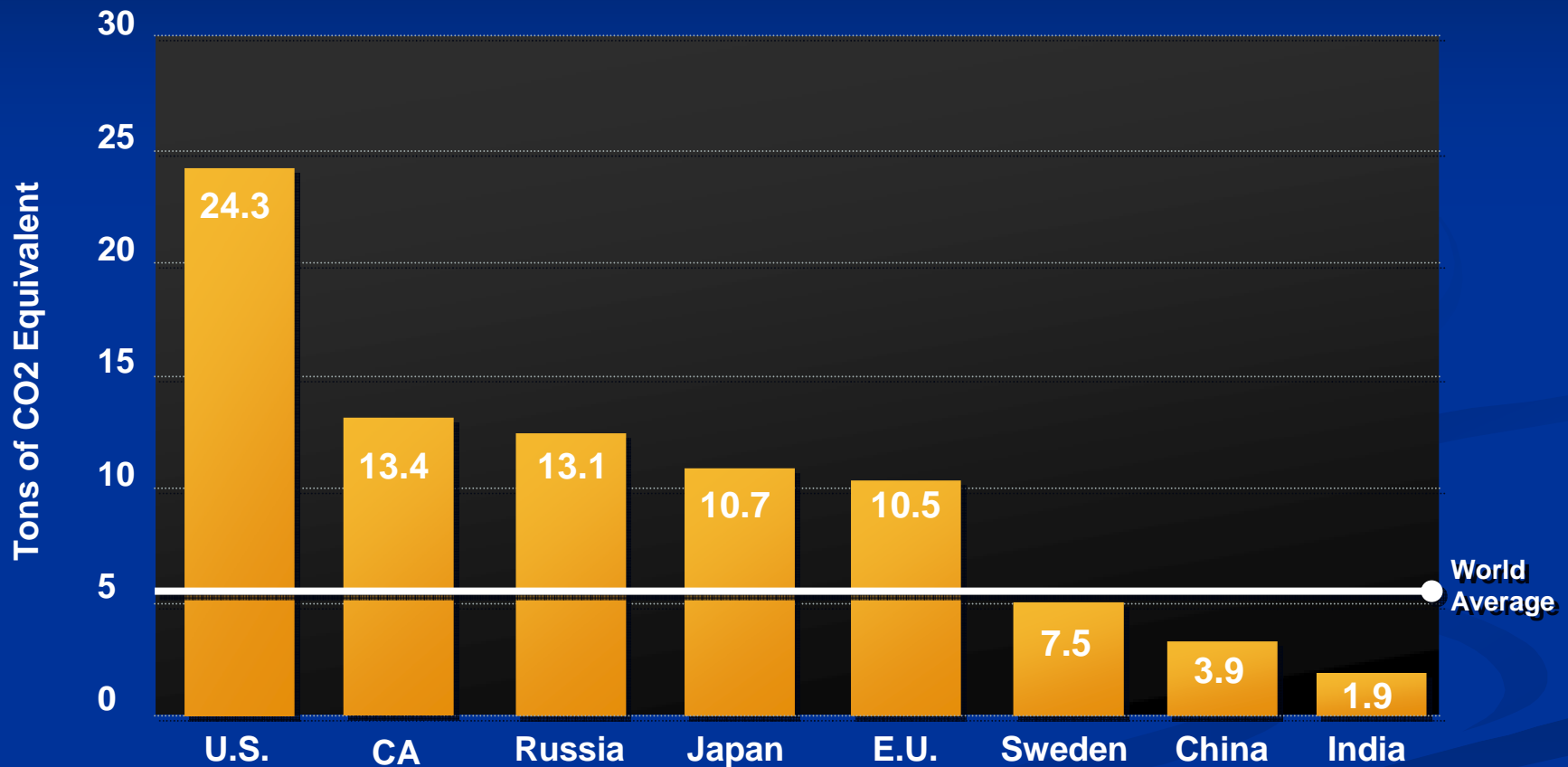
2003



Projected Global Warming Impact on California, 2070-2099 (as compared with 1961-1990)



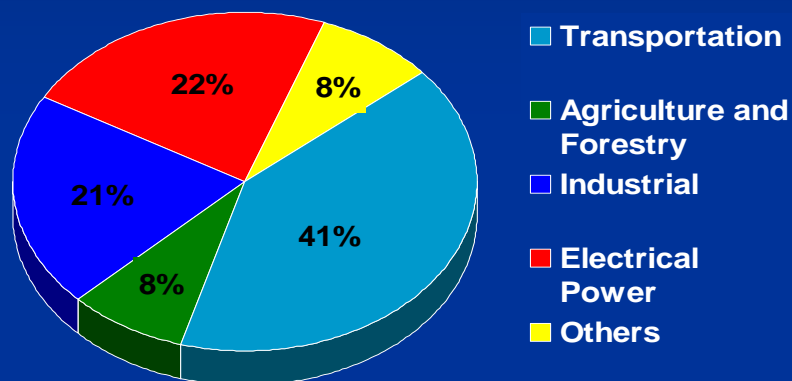
Annual GHG Emissions Per Person



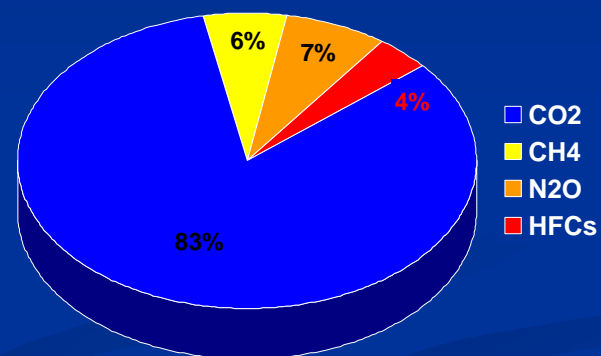
Source: Climate Analysis indicators Tool (CAIT US Version 1.0, CAIT version 4.0), World Resources Institute, 2007 (data is for CY 2001 – 2002 and includes CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆ emissions for countries and CO₂, CH₄, N₂O, and F-gases for CA)

California GHG Emissions

GHG EMISSION SOURCES
[~500 MMT CO₂ eq]



GHG EMISSIONS
BY TYPE



CO₂, N₂O



CO₂, CH₄, N₂O



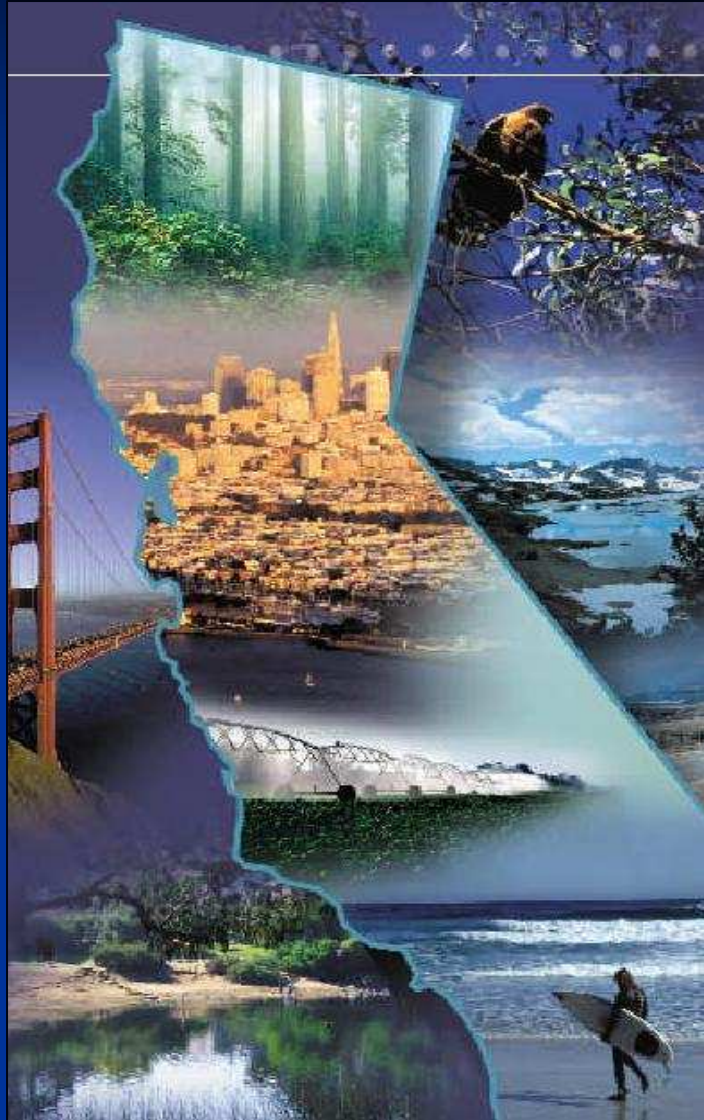
CO₂



CO₂

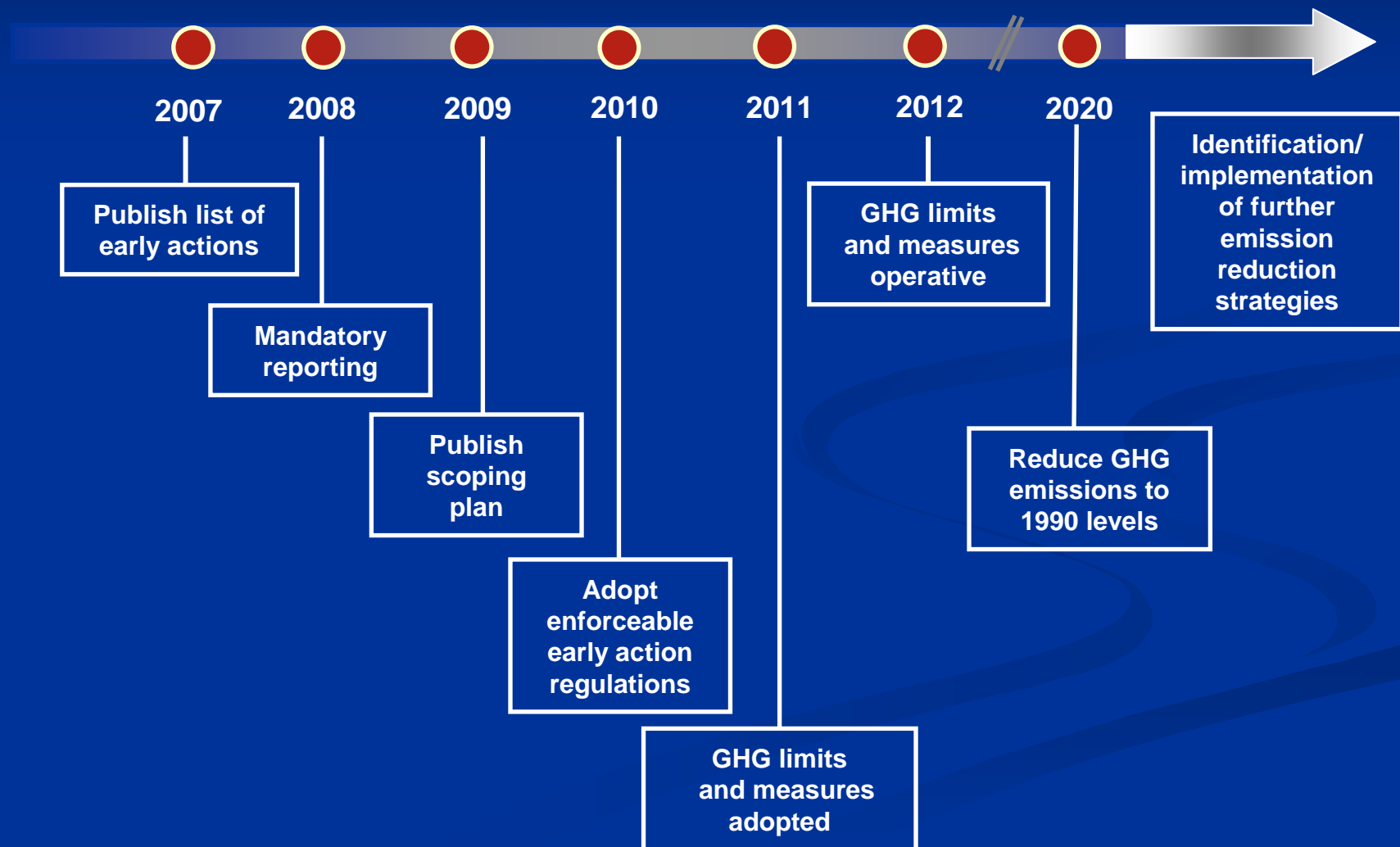


HFCs

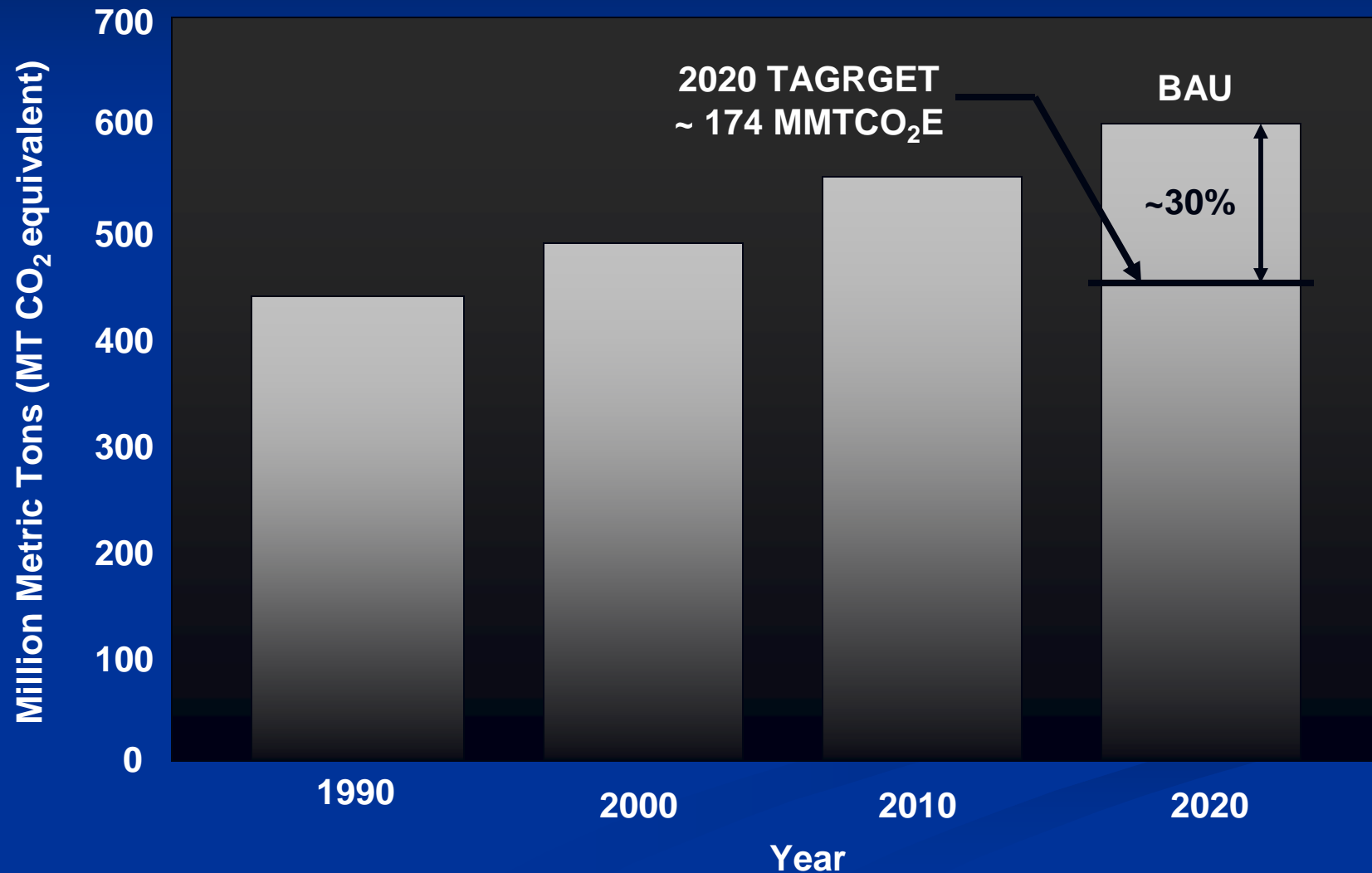


Schedule and Progress to Date

California Global Warming Solutions Act of 2006 (AB 32)



2020 Emissions Reduction Target (relative to 'business-as-usual' emissions)

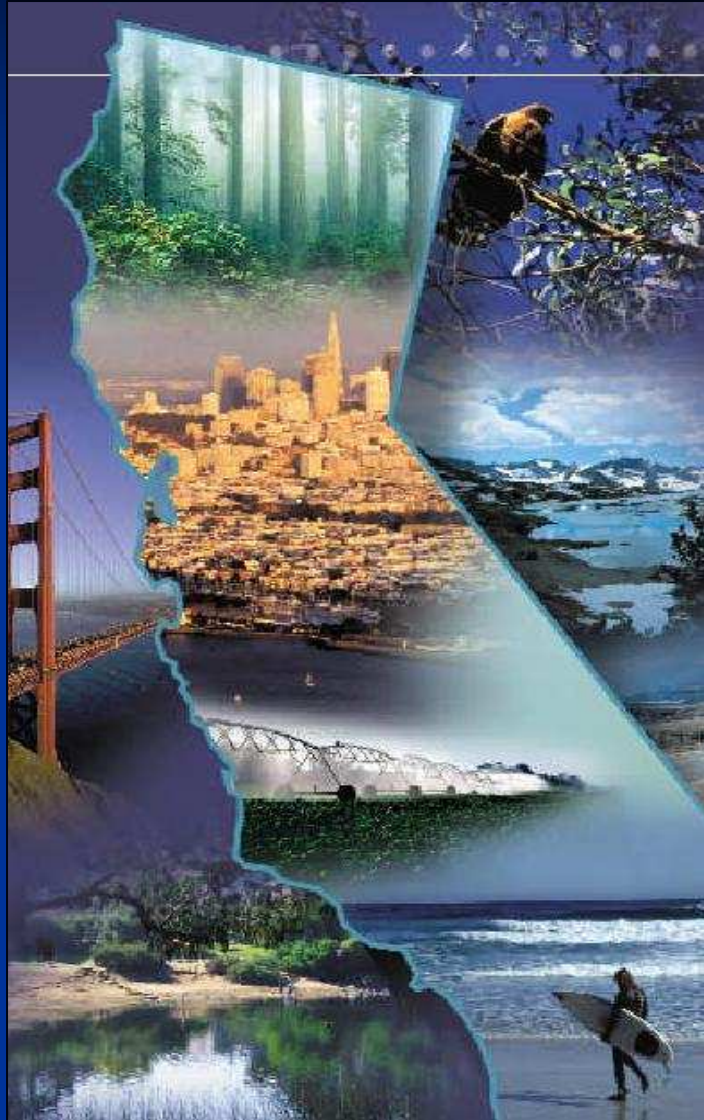


AB 32 Early Action Provision

- AB 32 recognized that considerable progress in reducing California's GHG emissions could and should be made as comprehensive measures are developed
- Objective of the early action provision is to address the serious threat posed by climate change by taking immediate actions to mitigate GHG emissions
- The Act requires the Board to identify a list of “discrete early actions” measures by June 21-22, 2007
 - once on the list, these measures are to be developed into regulatory proposals, adopted by the Board, and made enforceable by January 1, 2010

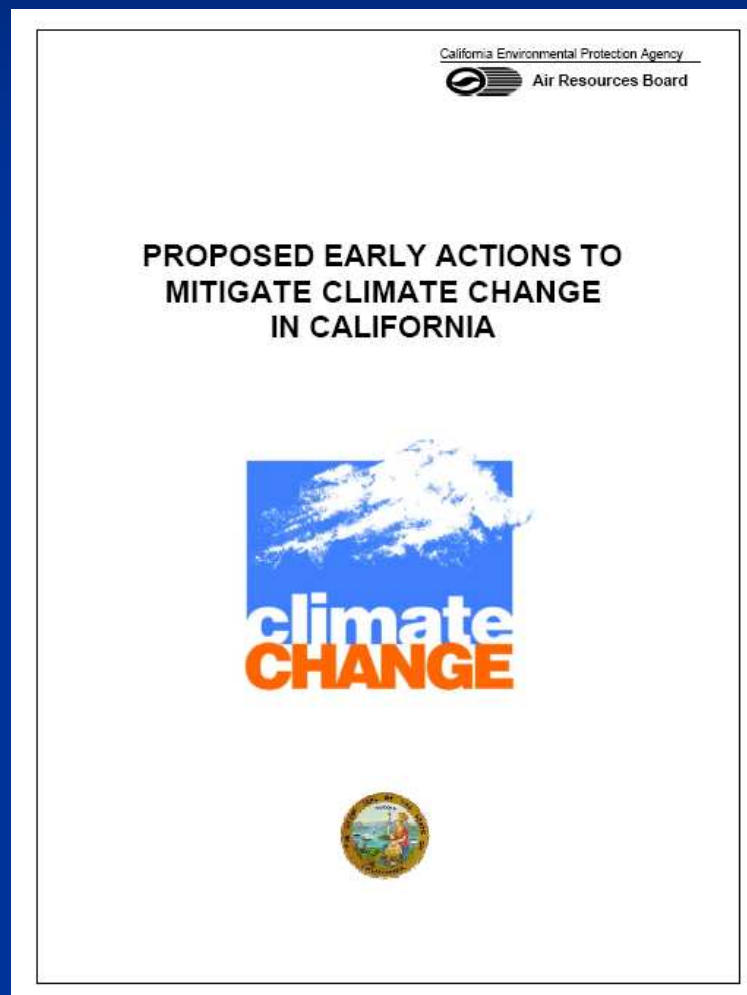
What has happened since first Early Action Workshop?

- Suggestions from 1st workshop have been considered by the ARB and CAT
- Subsequent input from stakeholders
- Internal discussions
- Early Actions Report
- Set for Board Hearing June 20-21, 2007



Update on Early Action Strategies

Early Action Support Document Summary



MAIN DOCUMENT

- Summary
- Adopted Regulations
- Early Action Strategies - ARB
- Early Action Strategies - other agencies
- Voluntary Actions
- Education Efforts

ATTACHMENT A

- Stakeholder Suggestions Under ARB Jurisdiction

ATTACHMENT B

- Stakeholder Suggestions for the CAT Forwarded from the ARB

ARB ADOPTED REGULATIONS

Vehicle Climate Change Standards
Criteria and Air Toxic Controls

EARLY ACTIONS TO REDUCE GHGs CALENDAR YEARS 2007, 2008, 2009

ARB MEASURES

GROUP 1

Discrete Early Action Measures

GROUP 2

Additional Greenhouse Gas
Reduction Strategies

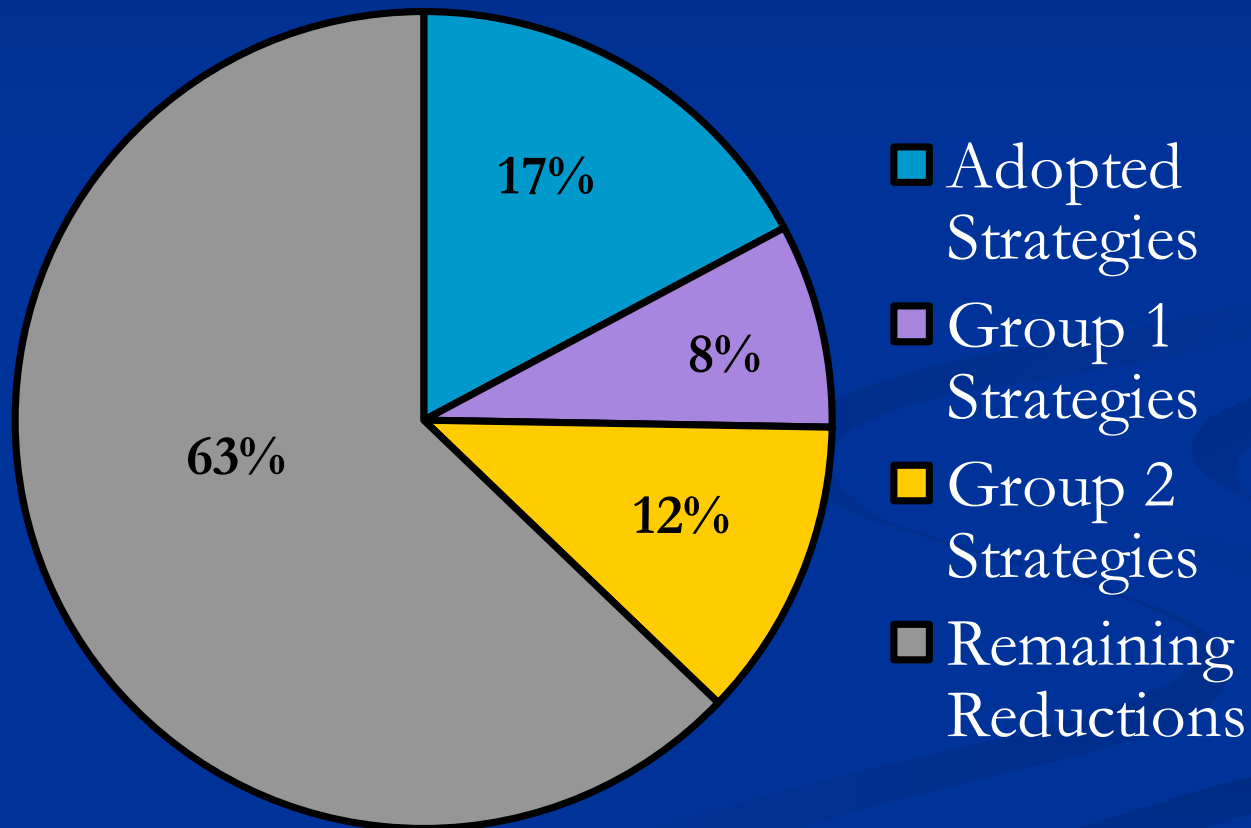
GROUP 3

Criteria and Air Toxic
Control Measures

CLIMATE ACTION TEAM MEASURES

2020 Emission Reductions from Early Action Document

LOWER ESTIMATE (63 of 174 MMTCO₂E)



GROUP 3 and CAT STRATEGY REDUCTIONS ARE TBD

ARB Adopted Regulations

- Vehicle greenhouse gas standards (AB 1493)
- Criteria and Air Toxics Controls
 - ARB Diesel Risk Reduction Plan initiatives
- Estimated emissions reductions of 30 million metric tons of CO₂ equivalent (MMTCO₂E) annually by 2020 relative to "business as usual" projected levels
 - exclusive of the benefits from reducing diesel particulate matter, ozone precursors and other pollutants

Vehicle Climate Change Standards (AB 1493)

- Reduction of climate change emissions emitted by passenger vehicles and light duty trucks
- Regulations adopted by ARB September 2004
- Emissions savings of ~ 30 MMTCO₂E by 2020
- Operating cost savings > incremental costs of improved technologies
 - consumer savings of \$5 billion annually by 2020 and the creation of over 50,000 jobs

Criteria and Air Toxics Controls

- ARB Diesel Risk Reduction Plan has resulted in important climate protection benefits
 - diesel PM has a net warming effect on the climate
- 20 diesel risk reduction regulations have been adopted between Oct. 2001 and Nov. 2006
 - low-sulfur diesel fuels
 - diesel truck operational idling limits
 - border truck inspection protocols
- Emissions reductions not counted towards 2020 target

Global Warming Potential (GWP)

- GWP index compares global warming caused by emissions of a greenhouse gas to that of CO₂ emissions
- GWP defined as the integrated Radiative Forcing (watts/m²) following release of 1 kg of the gas divided by the integrated RF following emission of 1 kg of CO₂
- GWP defined in terms of the time horizon of the integration
- IPCC publishes consensus GWPs for 20, 100 and 500 year time horizons, but the Kyoto Protocol has adopted the 100 year GWPs

GWP Uncertainties / Limitations

- Radiative Forcing per unit atmospheric abundance is both non-linear (CO_2 , CH_4 , N_2O) & uncertain (PM)
- Atmospheric abundance per unit emission is based on uncertain lifetimes (CO_2 , O_3 precursors, diesel PM, PM)
- Use of RF and GWP as metrics of climate change for short-lived, “regional” species (O_3 precursors, diesel PM, PM) has additional uncertainty
- Indirect effects of a species on Radiative Forcing has been quantified by the IPCC for some species (e.g., CO & VOC on O_3) but not others (e.g., PM on clouds).

IPCC Consensus GWPs

AB 32 / Kyoto Protocol Greenhouse Gas	Lifetime (years)	Kyoto GWP	IPCC 2007 GWP	
		100 years	20 years	100 years
Carbon Dioxide (CO ₂)	~150	1	1	1
Methane (CH ₄)	12	21	72	25
Nitrous Oxide (N ₂ O)	114	310	289	298
HFC-134a	13.8	1,300	3,830	1,430
Sulfur Hexafluoride (SF ₆)	3,200	23,900	16,300	22,800

No IPCC Consensus

Sample California Calculations

Greenhouse Gas	100 year GWP ^a	MMT ^b	MMTCO ₂ E
CO	1.0 – 3.0	4.56	5 – 15
VOC	1.1 – 6.2	0.81	1 – 5
NO _x	-10 – 5 ^c	1.07	-10 – 5
Diesel PM	500 – 1,200	0.029	15 – 35
Other PM	unknown	--	likely negative

^a Fossil fuel soot GWP range from Hansen et al. (2007) and Jacobson (2005), all others from IPCC (2001)

^b The California Almanac of Emissions and Air Quality – 2006 Edition

^c GWP of 450 for aircraft emissions

Stakeholder Suggestions

- ARB received approximately 70 suggestions from stakeholders
- A summary table of all stakeholder suggestions is contained in Attachments A and B of the Early Action support document
 - Very diverse suggestions: new standards, land, efficiency, clean fuels, etc.
 - 24 suggestions under ARB jurisdiction
 - 48 suggestions forwarded to the CAT
- ARB staff appreciates all of the suggestions that have been received so far and looks forward to additional public comments in response to this document

Early Action Screening Framework

- Adoptable by ARB in CY 2009 or earlier
- Legally effective by January 1, 2010
- Technologically feasible
- Cost effective
- Reductions of significant magnitude
- Sufficient resources to develop and implement
- Potential for adverse impacts on criteria or toxic emissions

Early Action

Screening Framework (cont.)

- Potential for disproportionate impacts on low-income communities or other disadvantaged sectors, or on small businesses
- Significant loss of benefits due to leakage
- Coordination opportunities with related actions that may have been taken or are planned by other entities

Early Actions – ARB Measures

- ARB early actions are grouped into 3 categories
- Collectively, ARB has identified 36 early actions that will reduce GHG emissions by 33 to 46 MMTCO₂E annually by 2020
 - exclusive of contributions from reductions in diesel PM and other measures whose reductions are to be determined (TBD)
 - 40 to 60 percent of these reductions are expected from three recommended discrete early action measures

Group 1 - Discrete Early Actions

Strategy Number	Description of Strategy	Source of Strategy	Potential CA Reductions (for 2020)
			MMT CO ₂ E
DISCRETE EARLY ACTIONS PURSUANT TO AB 32 SECTION 38560.5			
1-1	Low Carbon Fuel Standard (LCFS)	Governor's Executive Order Stakeholder Suggestion	10 to 20
1-2	Reduction in emissions of HFC-134a from non-professional servicing of Motor Vehicle Air Conditioning Systems (MVACS)	Climate Action Team Report Stakeholder Suggestion	1 to 2
1-3	Expand landfill methane capture	Climate Action Team Report	2 to 6

GROUP 1a TOTAL

13 to 28

Strategy 1-1

Low Carbon Fuel Standard

- Same as discussed during last workshop
- Will require fuel providers to ensure that the mix of fuels they sell in California meet, on average, a declining standard for greenhouse gas emissions that result from the use of transportation fuel
- Reductions of 10-20 MMTCO₂E in 2020



Strategy 1-2 : Restrictions on High GWP Refrigerants

- Same as discussed during last workshop
- Would restrict the use of high global warming potential refrigerants for non-professional recharging of leaky automotive air conditioning systems
- Reductions of 1-2 MMTCO₂E in 2020



Strategy 1-3

Landfill Methane Capture

- Strategy from CAT and a stakeholder suggestion



- Would set statewide standards for the installation and performance of active gas collection/control systems at municipal solid waste landfills
- Reductions of 2 to 4 MMTCO₂E in 2020

Group 2 Early Action Strategies

- 23 measures targeted at climate
 - ARB GHG reduction strategies from the March 2006 CAT Report
 - other strategies that the ARB has identified as part of the early action process that will result in GHG reductions
- Not recommended for formal inclusion in Group 1 early action strategies
 - require additional analysis of emissions control technologies or costs
- Expected reductions of ~20 MMTCO₂E by 2020

Group 3 Early Action Strategies

- 10 measures targeted at criteria pollutants or air toxics that may also have climate co-benefits
- These measures are part of the ARB's Diesel Risk Reduction Plan, the Goods Movement Emissions Reduction Plan, or the State Implementation Plan
- GHG reductions in terms of MMTCO₂E are undetermined at this time

Climate Action Team Measures

- Several CAT efforts are currently underway throughout the state
 - Cal/EPA – Integrated Waste Management Board
 - Resources Agency – Department of Forestry, Energy Commission, Department of Water Resources
 - Other State Agencies – Business Transportation and Housing, Department of Food and Agriculture, State and Consumer Services Agency
 - Public Utilities Commission

Climate Action Team Measures

- A number of useful suggestions for potential strategies have been submitted by numerous stakeholders
 - considered by the Climate Action Team
 - summary in Attachment B of support document
- Cal/EPA is currently assembling a separate document on early actions to be undertaken by Climate Action Team members



Climate Action Team Early Actions

Andrew Altevogt, PhD.
California Environmental Protection Agency

Background on Climate Action Team



Created in response to Executive Order S-3-05



Responsibility under Global Warming Solutions Act of 2006 for coordinating climate policy across state government



Members: SCSA, BTH, CDFA, CEC, CalFire, DWR, ARB, IWMB, PUC



Coordinated by Secretary Adams of Cal/EPA



2006 Report



Outlined over 40 strategies for reducing GHG emissions



Emission Reductions of 60 MMTCO₂E by 2010 and 190 by 2020

Background on CAT Report



First Draft for Public Review



Companion to ARB report – Demonstrates the early efforts of other CAT members



Organization is similar to ARB report – Group 1, Group 2, Group 3



Group 1: >20 MMTCO₂E in 2020



Group 2: >60 MMTCO₂E in 2020

Group 1 – Discrete Actions



BTH



Cement Manufacture – 2.5% interground limestone blend now allowed



<1 MMTCO₂E in 2020



CDFA



Hydrogen Fuel Standards – standards to be completed by 2008

Group 1 – Discrete Actions



CEC



Energy Efficient Building Standards – New regulations in 2008



Energy Efficient Appliance Standards – Light bulb efficiency standards



Tire Efficiency – Replacement tire program



<1 MMTCO₂E in 2020



New Solar Homes Partnership – Incentive funds

Group 1 – Discrete Actions



CEC/PUC



SB1368 – Collaboration on utility procurement practices



15 MMTCO₂E in 2020



PUC



IOU Energy Efficiency – Incentive mechanism for encouraging additional investment by IOUs



IWMB



Landfill Gas Recovery – Collaboration with ARB

Group 1 – Discrete Actions



DWR



Water Use Efficiency – Standards for projects funded through water bonds



1 MMTCO₂E in 2020



State Water Project – renewable energy in SWP portfolio



Cleaner Energy for Water Supply – No extension of Reid Gardner plant contract

Group 2 – Other Actions Underway

Examples



SCSA/DGS



Green Building Initiative efforts – Retro-commissioning, Automating energy data collection, Solar generation



CalFire



Urban Forestry – Development of forestry protocol



CEC



Land Use/Smart Growth

Group 3 – Actions with Climate Co-Benefits - Examples



CDFA



Dairy Management Practices



CEC



Report to Legislature on AB1007 (Alt. Fuels)



CalFire



Wildfire Control Program



DWR



Urban Best Management Practices



IWMB



Commercial Recycling

For More Detailed Information

California Climate Change Portal:

www.climatechange.ca.gov

Ongoing Regulatory Hearings and
Workshops of CAT members

June 26 Public Meeting of the CAT

Comments and questions:

climatechange@calepa.ca.gov

Voluntary Actions

- Working on methods to recognize voluntary early actions by industry, government, and individuals
- Investigating a framework for quantification and documentation of voluntary actions
 - acknowledgment and verification of real, permanent, and surplus reductions relative to regulatory requirements
 - first step is to develop interim guidance for quantification, documentation, and verification
 - for the long-term, examining a process for translating voluntary emission reductions into creditable reductions consistent with the broader AB 32 implementation strategy

Education Efforts

- Well crafted public education efforts have the potential to achieve real emission reductions.
- ARB will actively pursue a number of public education efforts in coordination with Cal/EPA, the Climate Action Team, and other interested parties.
- Such efforts will include establishing a product labeling program and identifying best practices for consumers, developing California-specific GHG footprint calculators, and developing an eco-driver training program.

Next Steps

- Refinements to Early Action Support Document following public input
 - Request any additional written comments by May 7, 2007
- Report to the Board on June 21-22, 2007
- With Board approval, begin regulatory development process for the discrete early actions as proposed
- Continue development of other early actions
- Continue progress on voluntary actions, scoping plan, and other tasks

For More Information

To stay current on the latest ARB Climate Change activities, visit our website:

<http://www.arb.ca.gov/cc/cc.htm>

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